

REMARKS

The Examiner has indicated that the present action is final. Applicant submits that such a final rejection is not proper. The Examiner has entered a new ground for rejection with respect to Claims 6 and 11. This rejection was not caused by any amendment made to the claims in question by Applicant. In the prior response, Applicant merely amended Claims 6 and 11 to place these claims in independent form. Hence, the amendments could not have changed the scope of the claims. Applicant also wishes to point out that the rejections under 35 U.S.C. 112 discussed below are also new rejections that were not caused by any amendment made by Applicant in the previous response.

Claims 3-6 and 9-11 are pending in this application.

The Examiner objected to Claim 3, because "semiconducting" should be changed to "semiconductor". The above amendment to Claim 3 provides the requested change.

The Examiner objected to Claim 11 because there was no antecedent basis for "said substrate". The above amendment to Claim 11 provides the required antecedent basis.

The Examiner rejected claims 3-6 under 35 U.S.C. 112, second paragraph because the structural relationship between the active layer and the n-p junction is not recited in the claims. The above-amendments to Claims 3, 4 and 6 clarify the relationship between the various layers.

The Examiner rejected Claim 3 under 35 U.S.C. 103(a) as being unpatentable over Ibbetson, *et al* (hereafter "Ibbetson")(US 6,515,313) in view of Tan, *et al* (hereafter "Tan")(US 6,369,403). Applicant assumes that the Examiner meant to refer to Tan as US Patent 5,892,784, since US Patent 6,369,403 is the Holonyak patent. Applicant traverses this rejection.

In making this rejection the Examiner looks to the embodiments shown in Figure 9A of Ibbetson and Figure 2A of Tan. The Examiner maintains that one would be motivated to

combine the teachings because Tan teaches that the inclusion of the reverse-biased tunnel junction between the substrate and the p-type mirror increases device reliability.

It should be noted that Ibbetson teaches an edge-emitting laser structure, and Tan teaches a VCSEL structure. The advantages that the tunnel junction provides in the VCSEL structure relate to eliminating the etching of the stack to expose a contact below the bottom mirror. This advantage is limited to VCSEL structures because such structures have very large depths due to the mirror layers. The large depth makes etching through the device in a reliable manner difficult. Hence, the gains obtained by avoiding this etching step outweigh the negative factors inherent in the tunnel junction structure. A tunnel junction increases the operating voltage of the laser and the power dissipation in the device. Hence, such diodes are normally not used in a laser unless some significant other advantage is achieved. Edge-emitting lasers do not suffer from these problems since the etch depth required to expose the bottom contact layer is significantly less. Hence, one would not be motivated to include such a tunnel diode in an edge-emitting laser to improve reliability. The Examiner has not pointed to any other teaching in the references that would cause someone of ordinary skill to include a tunnel junction in an edge-emitting laser. The above amendment to Claim 3 limits the present invention as claimed in Claim 3 to edge emitting lasers to further distinguish the present invention from that taught in Tan.

The Examiner rejected Claims 6 and 11 under 35 U.S.C. 103(a) as being unpatentable over Ibbetson in view of Yamada (US 5,693,965). Applicant traverses this rejection.

In making this rejection the Examiner admits that Ibbetson does not teach that the active layer is grown at an angle to the substrate. The Examiner looks to Yamada as providing the missing teaching. The Examiner specifically points to layer 302C in Figure 4 of Yamada as the active layer that is grown at an angle to the underlying planar substrate 301.

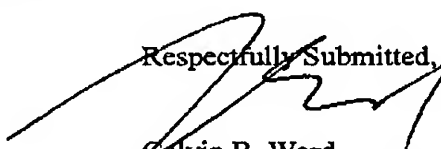
Applicant must disagree with the Examiner's reading of Yamada. The active layer taught in Yamada is layer 302B, which is a planar layer that is parallel to substrate 301. Layer 302C is a cladding layer. Accordingly, Applicant submits that the combination of Ibbetson and Yamada does not teach all of the limitations of Claims 6 and 11, and hence, the Examiner has not made a *prima facie* case for obviousness with respect to Claims 6 and 11.

The Examiner stated that Claims 4-5 would be allowable if rewritten or amended to overcome the rejections(s) under 35 U.S.C. 112. Applicant submits that these claims are now in condition for allowance.

The Examiner also stated that Claims 9-10 are now allowed.

I hereby certify that this paper is being sent by FAX to 703-872-9319. 9306

Respectfully Submitted,


Calvin B. Ward
Registration No. 30,896
Date: Feb. 10, 2004

Agilent Technologies, Inc.
Legal Department, M/S DL429
Intellectual Property Administration
P.O. Box 7599
Loveland, CO 80537-0599
Telephone (925) 855-0413
Telefax (925) 855-9214